Homework Problem - Computer Lab

Given the power spectrum shown, together with the “voltage spectrum” (.xls file) -

1) Is this a peak voltage spectrum, rms, or something else?
Hint 0 dBm = 1 mW rms into a 50 ohm load.

2) What is the relation between the given voltage spectrum and $|V_k|$?

3) Plot the power spectral density in (Volts^2 / Hz) vs. deltaFreq

4) What is the voltage variance and standard deviation in the full 10 kHz frequency span, not counting the carrier.?
Note - deltaFreq < 0 does not imply V_k -> V_k * = V_{-k}

5) What is the ratio of rms voltage in the upper 360 Hz sideband to the overall rms voltage corresponding to deltaFreq > 0 ?

6) What is the ratio of the rms voltage in the 360 Hz sidband to the rms voltage associated with the upper synchrotron sideband between 1.5 and 2.5 kHz.

7) Plot the square root of the reverse-integrated power spectral density from 5 kHz down to, but not including deltaFreq=0, in volts rms. Simpson rule integration is good enough.